WHAT IS CLAIMED IS:

1. A semiconductor device having a pad formed by exposing a predetermined region of a metal line formed over a semiconductor substrate, the semiconductor device comprising;

an alloy layer formed on the metal line exposed through the pad, wherein the alloy layer is formed from a reaction between the metal line and a metal having a melting point less than or equal to 1000°C.

2. The semiconductor device of claim 1, wherein the metal line is made of copper.

3. The semiconductor device of claim 1, wherein the metal having the melting point less than or equal to 1000°C is selected from the group consisting of aluminum, lead, and silver.

4. The semiconductor device of claim 1, wherein the thickness of the alloy layer is less than a thickness of the metal line.

5. The semiconductor device of claim 1, wherein a protection layer made of one of silicon nitride and silicon oxynitride is formed on the metal line except where the pad is formed.

6. The semiconductor device of claim 2, wherein the copper is filled in a via.

7. The semiconductor device of claim 6, wherein a barrier metal is formed on an interface between the copper and the via made from a metal selected from the group consisting of Ti, Ta, TiN, and TaN having a thickness between 200 and 800Å to prevent the diffusion of the copper out of the via.

8. The semiconductor device of claim 6, wherein a width of the pad is less than a width of the via.

9. A method of fabricating a semiconductor device comprising:

forming a via by etching a predetermined region of an insulating layer over a semiconductor substrate;

filling the via with a metal to form an outermost metal line;

forming a reaction layer on the outermost metal line and the insulating layer, wherein the reaction layer has a melting point of less than or equal to 1000°C; and

performing a heat treatment process to react the reaction layer and the outermost metal line, thereby forming an alloy layer on a interface between the reaction layer and the outermost metal line.

10. The method of claim 9, wherein the outermost metal line is made of copper.

11. The method of claim 9, wherein the reaction layer is made of a material selected from the group consisting of aluminum, lead, and silver.

12. The method of claim 9, wherein a physical vapor deposition process including a sputtering method is used to form the reaction layer at a temperature of 300°C or less.

13. The method of claim 9, wherein the reaction layer is deposited to a thickness that is less than a thickness of the outermost metal line.

14. The method of claim 9, wherein the heat treatment process is performed at a temperature of 350～450°C for a duration of 10 to 60 minutes.

15. The method of claim 10, wherein the copper is formed on a barrier metal layer after forming the barrier metal layer from a metal selected from the group consisting of Ti, Ta, TiN, and TaN having a thickness between 200 and 800Å along inner walls of the via to prevent the diffusion of the copper out of the via.

16. The method of claim 9, further comprising the steps of:

performing an anisotropic etching process until the insulating layer is exposed such that the alloy layer is left remaining within the via;

forming a protection layer on the insulating layer and the alloy layer; and

etching a predetermined region of the protection layer to form a pad that exposes a predetermined region of the alloy layer.

17. The method of claim 16, wherein the protection layer is formed of one of silicon nitride and silicon oxynitride.

18. The method of claim 16, wherein the predetermined region of the protection layer is etched to a width less than a width of the via to form the pad.

19. The method of claim 16, wherein the anisotropic etching process is one of a chemical mechanical polishing process and an etch back process.

20. The method of claim 16, further comprising a cleaning process that is performed after the anisotropic etching process, and a heat treatment process that is performed at a temperature of 250～350°C for a duration of 10 to 60 minutes after the cleaning process.